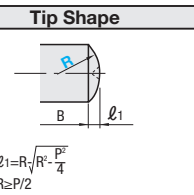


Locating Pins - Tip Shape Selectable

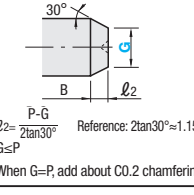
Press Fit

■Features: The tip shape is selectable from three types. Highly customizable with each dimension configurable. Press Fit.

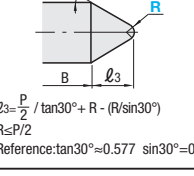
Material No.	Material	Surface Treatment	Hardness	Round			Diamond		
				d dim. Tolerance m6	d dim. Tolerance p6	d dim. Tolerance m6	d dim. Tolerance p6	d dim. Tolerance m6	d dim. Tolerance p6
①	SKS3 Equivalent	-	Treated Hardness: 55 ~ 60HRC	LPEJ	LPPEJ	LPDEJ			
②	SKS3 Equivalent	Hard Chrome Plating	Treated Hardness: 50 ~ 55HRC Plating Hardness: 750HV ~	LPEG	LPPEG	LPDEG			
③	S45C Equivalent (LPEJ, LPPEJ, LPDEJ)	-	Treated Hardness: 45 ~ 50HRC	LPE	LPPE	LPDE			
④	S45C Equivalent (LPEB, LPPEB, LPDEB)	Black Oxide	Treated Hardness: 45 ~ 50HRC	LPEB	LPPEB	LPDEB			
⑤	S45C Equivalent (LPER, LPPEP, LPDEP)	Hard Chrome Plating	Treated Hardness: 45 ~ 50HRC Plating Hardness: 750HV ~	LPER	LPPEP	LPDEP			
⑥	SUS304	-	-	LPES	LPPEP	LPDES			
⑦	SUS304	Hard Chrome Plating	Plating Hardness: 750HV ~	LPED	LPPEP	LPDED			
⑧	SUS440C or 13Cr stainless	-	Treated Hardness: 50 ~ 55HRC	LPEC	LPPEC	LPDEC			



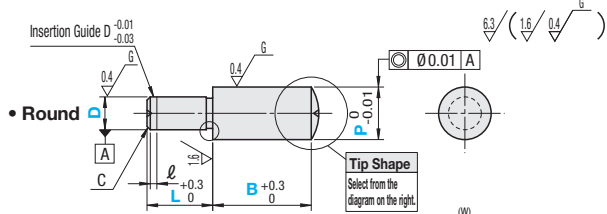
Shape A
 $\ell_1 = R \sqrt{R^2 - \frac{P^2}{4}}$
 $R \geq P/2$



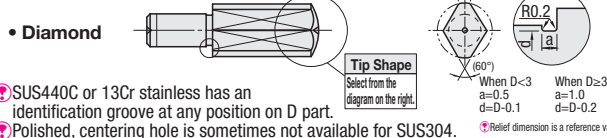
Shape B
 $\ell_2 = \frac{P-G}{2 \tan 30^\circ}$ Reference: $2 \tan 30^\circ \approx 1.15$
 $G \leq P$
 When $G=P$, add about C0.2 chamfering.



Shape C
 $\ell_3 = \frac{P}{2} / \tan 30^\circ + R - (R/\sin 30^\circ)$
 $R \leq P/2$
 Reference: $\tan 30^\circ \approx 0.577$ $\sin 30^\circ = 0.5$



• Round
 Insertion Guide D: $\frac{D}{0.01} \pm 0.03$
 $\frac{6.3}{\sqrt{16}} \left(\frac{0.4}{\sqrt{16}} \right)^G$
 Tip Shape: Select from the diagram on the right.



• Diamond
 Tip Shape: Select from the diagram on the right.
 When $D < 3$, $a = 0.5$, $d = D - 0.1$
 When $D \geq 3$, $a = 1.0$, $d = D - 0.2$
 Relief dimension is a reference value.

• SUS440C or 13Cr stainless has an identification groove at any position on D part.
 • Polished, centering hole is sometimes not available for SUS304.

Part Number	Type	Tip Shape	D	D dim. Tolerance m6	D dim. Tolerance p6	P		B		R		G		L	C	ℓ	(W)
						0.01mm Increment	0.1mm Increment	1mm Increment	1mm Increment	1mm Increment	1mm Increment						
LPEJ, LPPEJ, LPDEJ, LPEG, LPPEG, LPDEG, LPE, LPPE, LPDE, LPEB, LPPEB, LPDEB, LPER, LPPEP, LPDEP, LPES, LPPEP, LPDES, LPED, LPPEP, LPDED, LPEC, LPPEC, LPDEC	(Round) m6	A	2	+0.008	+0.012	2.50-4.00	2.0-25.0(10.0)			Shape A				2-6	0.5	0	1.2
	(Round) p6	A	3	+0.002	+0.006	3.50-6.00	2.0-25.0(10.0)			Shape A				3-6			1.5
	(Diamond) m6	B	4	+0.012	+0.020	4.50-9.00	2.0-25.0(10.0)			Shape A				4-8			1.8
		B	5	+0.004	+0.012	5.50-10.00	2.0-30.0(10.0)			Shape A				5-10			2.2
		B	6	+0.015	+0.024	6.50-12.00	2.0-40.0(12.0)			Shape B				6-12		1	3
		B	8	+0.006	+0.015	8.00-15.00	2.0-40.0(15.0)			Shape B				8-16		1.5	3.5
		B	10	+0.015	+0.015	11.00-20.00	3.0-50.0(20.0)			Shape B				10-20		2	4
		B	12	+0.018	+0.029	13.00-20.00	3.0-50.0(20.0)			Shape B				12-24		2	5
		B	16	+0.007	+0.018	17.00-25.00	5.0-50.0(20.0)			Shape B				16-32		3	7
		B	20	+0.021	+0.035	21.00-30.00	5.0-50.0(20.0)			Shape B				20-40		3	9

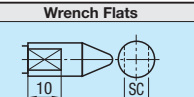
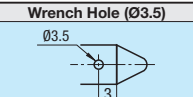
• B dimension in () is for Diamond Shape.

Ordering Example: Part Number - P - B - R - G - L
 LPEA5 - P10.00 - B12.0 - R6 - L5
 LPPEJB10 - P15.00 - B27.0 - G12 - L10

D	Round Shape Unit Price								Diamond Shape Unit Price							
	①SKS3 Hardened LPEJ	②Hard SKS3 LPEJ	③S45C LPE	④S45C Black Oxide LPEB	⑤Hard S45C LPER	⑥SUS304 LPES	⑦Hard SUS304 LPED	⑧SUS440C or 13Cr stainless LPDEJ	①SKS3 Hardened LPDEJ	②Hard SKS3 LPDEG	③S45C LPDE	④S45C Black Oxide LPDEB	⑤Hard S45C LPDER	⑥SUS304 LPDES	⑦Hard SUS304 LPDED	⑧SUS440C or 13Cr stainless LPDEC
2																
3																
4																
5																
6																
8																
10																
12																
16																
20																

Alterations: Part Number - P - B - R - G - L - (SC, LAC, LTE)
 LPEA5 - P10.0 - B12.0 - R6 - L5 - LTE

• Alterations are not available in Diamond Shape.

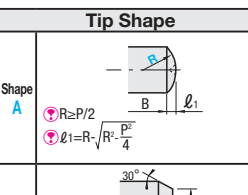
Alterations	Wrench Flats	Wrench Hole (Ø3.5)	Wrench Hole (Ø2.5)
			
Code	SC	LAC	LTE
Spec.	SC=1mm Increment • When B≤11, adds wrench flats on the tip. • P-3≤SC≤P-1, SC≥D	Adds a Ø3.5 hole. • Applicable when B≥10 and P≥8.	Adds a Ø2.5 hole. • Applicable when B≥8 and 7≤P≤15.

Locating Pins - Tip Shape Selectable

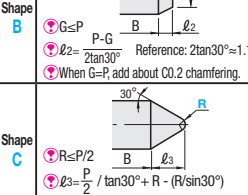
Tapped (Large Head / Straight)

■Features: The tip shape is selectable from three types. To be mounted from back using bolts. Improved maintainability compared to the press fit type.

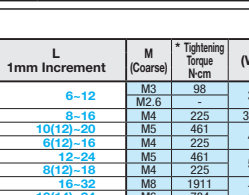
Material No.	Material	Surface Treatment	Hardness	Round	Diamond	Straight
				①	SKS3 Equivalent	-
②	SKS3 Equivalent	Hard Chrome Plating	Treated Hardness: 50 ~ 55HRC Plating Hardness: 750HV ~	LPGG	LPDGG	LPCG
③	S45C Equivalent (LPGJ, LPDGJ, LPCJ)	-	Treated Hardness: 45 ~ 50HRC	LPG	LPDG	LPC
④	S45C Equivalent (LPGB, LPDGB, LPCB)	Black Oxide	Treated Hardness: 45 ~ 50HRC	LPGB	LPDGB	LPCB
⑤	S45C Equivalent (LPRG, LPDGR, LPCR)	Hard Chrome Plating	Treated Hardness: 45 ~ 50HRC Plating Hardness: 750HV ~	LPRG	LPDGR	LPCR
⑥	SUS304	-	-	LPGS	LPDGS	LPCS
⑦	SUS304	Hard Chrome Plating	Plating Hardness: 750HV ~	LPGD	LPDGS	LPCD
⑧	SUS440C or 13Cr stainless	-	Treated Hardness: 50 ~ 55HRC	LPGC	LPDGC	LPCC



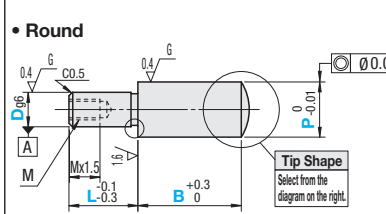
Shape A
 $R \geq P/2$
 $\ell_1 = R \sqrt{R^2 - \frac{P^2}{4}}$



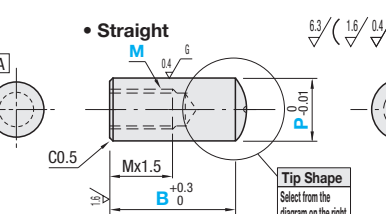
Shape B
 $G \leq P$
 $\ell_2 = \frac{P-G}{2 \tan 30^\circ}$ Reference: $2 \tan 30^\circ \approx 1.15$
 When $G=P$, add about C0.2 chamfering.



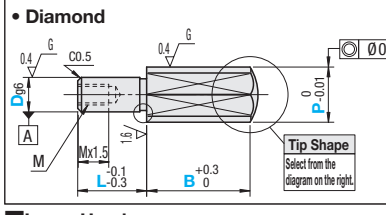
Shape C
 $R \leq P/2$
 $\ell_3 = \frac{P}{2} / \tan 30^\circ + R - (R/\sin 30^\circ)$
 Reference: $\tan 30^\circ \approx 0.577$ $\sin 30^\circ = 0.5$



• Round
 Tip Shape: Select from the diagram on the right.



• Straight
 Tip Shape: Select from the diagram on the right.



• Diamond
 Tip Shape: Select from the diagram on the right.

• SUS440C or 13Cr stainless of Round Type and Diamond Type has an identification groove at any position on D part.

Part Number	Type	Tip Shape	D	D dim. Tolerance p6	P		B		R		G		L	M	* Tightening Torque Ncm	(W)
					0.01mm Increment	0.1mm Increment	1mm Increment	1mm Increment	1mm Increment	1mm Increment						
LPGJ, LPDGJ, LPCJ, LPGG, LPDGG, LPCG, LPG, LPDG, LPC, LPGB, LPDGB, LPCB, LPRG, LPDGR, LPCR, LPGS, LPDGS, LPCS, LPGD, LPDGS, LPCD, LPGC, LPDGC, LPCC	(Round) m6	A	6	-0.004	6.50-12.00	2.0-40.0(12.0)			Shape A				6-12	M3	98	3
	(Diamond) p6	A	8	-0.005	9.00-15.00	2.0-40.0(15.0)			Shape A				8-16	M4	225	3.5
		B	10	-0.014	11.00-20.00	3.0-50.0(20.0)			Shape A				10(12)-20	M5	461	4
		B	12	-0.006	13.00-20.00	3.0-50.0(20.0)			Shape A				6(12)-16	M4	225	4
		B	16	-0.017	17.00-25.00	5.0-50.0(20.0)			Shape B				12-24	M5	461	5
		B	20	-0.020	21.00-35.00	5.0-50.0(20.0)			Shape B				8(12)-18	M4	225	5
		B	20T	-0.020	21.00-35.00	5.0-50.0(20.0)			Shape B				16-32	M8	1911	7
		B	20T	-0.020	21.00-35.00	5.0-50.0(20.0)			Shape B				10(14)-24	M6	784	7
		B	20T	-0.020	21.00-35.00	5.0-50.0(20.0)			Shape B				20-40	M8	1911	9
		B	20T	-0.020	21.00-35.00	5.0-50.0(20.0)			Shape B				12(18)-30	M6	784	9

• Pins of D dimension with T have one size smaller thread diameter and larger wall thickness. (Actual D dimension is the number without "T".)
 • B dimensions in () and L dimensions in () are for Diamond Shape. • Note the strength of under-head part. • P1566 • Please confirm pilot hole depth on P1566. Holes may go through.
 • The tightening torque (ref. value) for hardened products is strength class 8.8. (See technical data on P.2297) Not applicable when using locking agents or spring washers. Not applicable when using locking materials or lock washers.

D	Round Shape Unit Price								Diamond Shape Unit Price							
	①SKS3 Hardened LPGJ	②Hard SKS3 LPGG	③S45C LPG	④S45C Black Oxide LPGB	⑤Hard S45C LPRG	⑥SUS304 LPGS	⑦Hard SUS304 LPGD	⑧SUS440C or 13Cr stainless LPGC	①SKS3 Hardened LPDGJ	②Hard SKS3 LPDGG	③S45C LPDG	④S45C Black Oxide LPDGB	⑤Hard S45C LPDGR	⑥SUS304 LPDGS	⑦Hard SUS304 LPDGD	⑧SUS440C or 13Cr stainless LPDGC
6																
8																
10																
12																
16																
20																
20T																

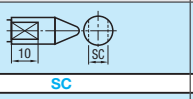
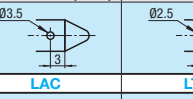
Part Number	Type	Tip Shape	M	P		B		R		G		Unit Price							
				0.1mm Increment	0.1mm Increment	1mm Increment	1mm Increment	①SKS3 Hardened LPCJ	②Hard SKS3 LPCG	③S45C LPC	④S45C Black Oxide LPCB	⑤Hard S45C LPCR	⑥SUS304 LPCS	⑦Hard SUS304 LPCD	⑧SUS440C or 13Cr stainless LPCC				
LPCJ, LPCG, LPC, LPCB, LPCR, LPCS, LPCD, LPCC	A	C	3	6.0-10.0	10.0-25.0			Shape A											
			4	7.0-12.0	11.0-25.0			Shape A											
			5	8.0-16.0	13.0-30.0			Shape A											
			6	9.0-20.0	15.0-40.0			Shape A											
			8	11.0-20.0	19.0-50.0			Shape A											
			10	14.0-20.0	23.0-50.0			Shape A											
			12	18.0-25.0	28.0-60.0			Shape A											
			16	22.0-30.0	35.0-60.0			Shape A											
			20	26.0-30.0	44.0-60.0			Shape A											

The tightening torque (ref. value) for hardened products is strength class 8.8. (See technical data on P.2365) Not applicable when using locking agents or spring washers.

Ordering Example: Part Number - P - B - R - G - L
 LPGA6 - P10.0 - B25.0 - R6 - L6
 LPGB10 - P16.0 - B50.0 - G13 - L16
 LPGA6 - P10.0 - B25.0 - R6

Alterations: Part Number - P - B - R - G - L - (SC, LAC, LTE)
 LPGA6 - P10.0 - B25.0 - R6 - LAC

• Alterations are not available in Diamond Shape.

Alterations	Wrench Flats	Wrench Hole (Ø3.5)	Wrench Hole (Ø2.5)
			
Code	SC	LAC	LTE
Spec.	SC=1mm Increment • For Round Type: P-3≤SC≤P-1, SC≥D • For Straight: M-3≤SC≤P-1 • When B≤11, adds wrench flats on the tip.	Adds a Ø3.5 hole. • Applicable when B≥10 and P≥8.	Adds a Ø2.5 hole. • Applicable when B≥8 and 7≤P≤15.